

The Influence of Alcohol on Blood Pressure

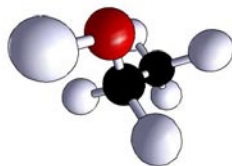
Introduction

Hypertension is an important preventable risk factor for cardiovascular disease, the leading cause of mortality in the UK. The pattern of alcohol intake is likely to be a major contributing factor in the complex effects of alcohol on cardiovascular disease. However, despite substantial evidence on the relationship between alcohol and blood pressure, there is considerable variation in the reported nature of this relationship. In particular, it is established that heavy drinking is associated with increased risk of hypertension but results are inconsistent at light and moderate levels of alcohol consumption. This study aimed to describe recent trends in alcohol consumption in England and to examine the association between alcohol consumption and blood pressure.

The study drew on data from 10 years (1994-2003) of the Health Survey for England (HSE), a series of annual surveys, commissioned by the Department of Health, designed to measure health and health-related behaviour in people living in private households. Measures and classifications of alcohol consumption used were:

- (1) Classification as never-drinker, ex-drinker or current drinker
- (2) Usual weekly consumption in units
- (3) Estimated average weekly consumption and level of 'binge' drinking - drinking a large amount within a short period.
- (4) Two drinking guidelines/limits to define drinking categories: (a) sensible weekly drinking, defined as drinking <14 units/week (women) or <21 units/week (men); and (b) 'binge drinking', defined as drinking >6 units in a day (women) or >8 units in a day (men).

The definition of hypertension used is in accordance with recent guidelines, that is, blood pressure $\geq 140/90$ mmHg, or on treatment with antihypertensive drugs. The analyses showed clear associations between drinking and raised blood pressure, with particular risks if exceeding weekly guidelines. For women, a beneficial effect of moderate drinking was seen, but not for men. For both sexes, the risk increased significantly above 14 units per week. The study provides information relevant to the development of appropriate health education strategies and targeted policies to reduce harmful effects of alcohol on health.



The research was carried out by Kiran Nanchahal, Sam Pattenden, Paola Primat-esta and Betsy Thom (Public & Environmental Health Research Unit, Department of Public Health and Policy, London School of Hygiene & Tropical Medicine).

Findings

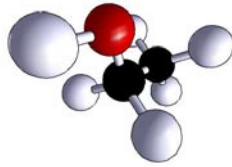
Trends

Weekly alcohol consumption

- There were small decreasing trends in the numbers of current drinkers, over the period, though with a possible upturn in 2003.
- Corresponding increases were seen in the numbers of non- and ex-drinkers. Increases in non-drinkers were predominantly seen among young men.
- Among drinkers the amount of alcohol consumed per week increased. The average increase per year was 0.20 (0.16-0.24) units per week for women, and 0.13 (0.04-0.23) units per week for men ($p=0.07$ for gender difference).
- Consumption among male drinkers remained considerably higher than among female drinkers, with mean weekly consumption levels in 2002 of 19.8 and 8.5 units respectively.
- The increase in consumption, for both sexes, was restricted to wine intake.

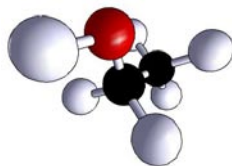
Patterns of drinking

- Among men drinkers overall, 56.9% adhered to both weekly and daily guidelines, compared to 71.8% of women.
- Among those not adhering to one or both limits/guidelines, both sexes most commonly exceeded the recommended weekly consumption (18.0% of men drinkers and 13.8% of women drinkers) without reporting binge drinking in the previous week.
- The least common pattern was to binge drink yet remain within weekly guidelines.
- Patterns of adherence to limits/guidelines varied strongly according to age, ethnicity, region, living alone, and socioeconomic factors such as car access, tenure, and qualification.
- Age: The proportion of 'moderate drinkers' (those adhering to both daily



and weekly limits) increased steeply with age, especially among men. The proportions of 'binge-drinkers' (i.e. over daily but not weekly limits) and 'excessive heavy-drinkers' (those exceeding both daily and weekly limits) decreased sharply with age (particularly for women). Trends across age were less pronounced among 'steady excessive drinkers' (those exceeding weekly limits, but not daily limits). For both men and women, this drinking pattern was more frequent among those aged 55-64.

- Ethnicity: White drinkers were more likely to exceed daily, weekly or both limits than non-whites. For both men and women, the odds of adhering to both limits in non-white drinkers was over 2.5 times that in white drinkers.
- Regional differences: Strong regional differences showed that those in the northern regions (North West, York & Humber, and particularly the North East) were least likely to drink moderately. Binge-drinking and excessive heavy drinking were correspondingly lower in the southern regions than in the north.
- Sole adult: Women who were the sole adult in their household were more likely to be heavy drinkers than those living with another adult. Correspondingly, men living with another adult were more likely to drink within both limits than those living alone. Associations between living alone and the other drinking categories were weaker.
- Car access: Men with no car access were more likely to drink above limits than those with car access - in particular, to be heavy drinkers and less likely to be moderate drinkers. Women with no car access were less likely to be moderate drinkers than those with car access, while there was weak evidence that they were more likely to be excessive heavy drinkers.
- Accommodation: For men and women, being in privately rented accommodation (compared to being a home owner) was associated with excessive heavy drinking. Those renting from the local authority were less likely to be steady excessive drinkers and, for women only, this was associated with drinking within both limits.
- Educational qualifications: Those with low levels of educational qualifications were more likely to drink within limits and less likely to be steady excessive drinkers.



Relationship between alcohol consumption and blood pressure

Average consumption

Women: Mean systolic blood pressure (SBP) among women was lowest among those drinking 8-28 units of alcohol per week. After adjusting for age and other potential confounders, the group with the lowest SBP was that drinking up to 7 units/wk. Non-drinkers had a significantly higher SBP, and SBP also rose as weekly alcohol consumption rose above seven units, with an average increase of nearly 5 mmHg in those drinking above 42 units/week.

The risk of hypertension was lowest amongst those drinking 1-7 units/week. Non-drinkers, and those drinking above 14 units/week had significantly higher risks, with the odds doubling in those drinking 43-49 units/week.

Men: Mean SBP was lowest amongst non-drinkers. In the adjusted model, SBP was lowest among non-drinkers, ex-drinkers and those drinking up to 7 units per week, after which it rose with increasing alcohol consumption, with an average increment of 4.39 (3.69;5.10) mmHg in those drinking 50 or more units/week.

The risk of hypertension among men drinking 1-7 units/week was not significantly different from the risk among non-drinkers, ex-drinkers or those drinking <1 unit/week, nor among those drinking up to 14 units/week. However, risk rose monotonically with alcohol intake above 7 units per week, with an odds ratio of 1.76 (1.58-1.96) in those drinking over 50 units/week.

Pattern of drinking

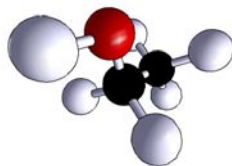
Risks of hypertension for both men and women were highest in those who exceeded weekly guidelines, especially if they also exceeded daily limits. For men, there was also a raised risk if exceeding daily guidelines only, but for women there was a marginally reduced risk in this group.

Conclusion: Public health Implications

This report shows a clear association between alcohol consumption and blood pressure. Systolic blood pressure (SBP) rose as weekly alcohol consumption rose, with

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an average increase of nearly 5 mmHg in those drinking above 42 (women) and 50 (men) units/week, compared to those who drank between one and seven units/week. However, a J-shaped association between SBP and alcohol was only seen in women. The risk of hypertension in women was lower amongst those drinking 1-7 units/week than in non-drinkers and in those drinking above those levels. In men no increase in risk was observed in those drinking up to 14 units/week. These results need to be taken into account when making recommendations on how many alcoholic drinks a hypertensive person should have when weighing up risks and benefits. It is clear that a reduction in alcohol intake reduces blood pressure and hence cardiovascular risk. In this study, the risks of hypertension for both men and women were highest in those who exceeded weekly guidelines, especially if they also exceeded daily limits. Hence heavy drinkers should be encouraged to reduce their amount of alcohol consumption and would benefit from a reduction to between one and seven units/week. However, stopping drinking altogether may not be beneficial.

Enquiries to:
Kiran.Nanchahal@lshtm.ac.uk

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